

TO: Molycorp MAA participants

FROM: Paul Robinson, Southwest Research and Information Center

DATE: February 22, 2000

RE: DRAFT Comments on selected work plan provided by Molycorp to the required by the Closeout Plan Extension Approval issued by the Mining and Minerals Division

Comments and Recommendations are provided which both address specific elements within the individual work plans as provided and general attributes which the work plans have as a set of documents. The comments addressed in this memo are a selected portion of comments identified during the review of the work plans and are provided to identify a range of concerns and should not be considered as a comprehensive or complete set of comments and recommendations.

I. Open Pit and Subsidence Area Waiver Information Investigation and Report Work Plan.

COMMENT: 1 -- (Work Plan Section) 1.1 - The whole concept of a "waiver" associated with open pit or subsidence activities is identified solely at the initiative of Molycorp. This concept is a point of sharply differing perspectives among MAA participants and Molycorp, because it includes the potential than NMMA standards for Closeout, including attention to self-sustaining ecosystems following operations and concurrence by NMED of conformance with its standards, may be severely compromised or not effectively implemented.

The option of a NMMA Rules "Waiver" of any Closeout requirements for the Open Pit and Subsidence has been identified by Molycorp for at least five years, including a period of more than three years before the current extension was approved. Unfortunately, no supporting previous technical work in this area is identified in the work plan. Such a lack of citation to reference material is a systematic weakness of all the work plans. As a result the work plan as provided is not reasonably complete or comprehensive. The lack of recognition of any of this past documentation or the multi-year dialogue among Molycorp, NM agencies and other parties regarding standards applicable to such a waiver results in the work plan being a poor vehicle for either:

* 1) progress on the NMMA Closeout Plan permitting required for the site - which is the primary goal focus of the Work Plans or

* 2) the cooperative planning and communication objectives of the MAA process; and a step backward rather than a step forward in Closeout plan progress.

RECOMMENDATION:

1) The Work Plan should be modified to fully identify and distribute all relevant portions of Molycorp's technical program related to the Open Pit and Subsidence areas, including:

a) all "anticipated" future mine plans, if any, including the potential for both the



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full underground and open pit mine scenarios, and the interaction between the two proposals, identified as "anticipated" on p. 1 of the WP:

b) distribution of the calculations and analysis which constitute the subsidence sequence modeled for such operating scenarios and comparisons to analogous mines and other data identified by Dr. Robertson in Molycorp NMMA permit hearing testimony and other communication.

2) Molycorp has provided an extremely shallow and superficial level of information regarding of their "anticipated" mining and associated open pit and subsidence scenarios. Molycorp's distribution of such material is long overdue and must be addressed before a "task-related" work plan can be considered seriously, either in the context of either a proposed waiver of some kind in the context of the NMMA rules or as a foundation for discussion in the MAA process. Molycorp's discussion is particularly lacking regarding the relationship between future mine plans and the economic and market limitation of the molybdenum resources it represents as "reserves" or minable ore, as well as the geotechnical aspects of mine design.

Therefore, Molycorp should provided analysis supporting its representations of minable resources, geotechnical aspects of mining those resources and the economic parameters which influence the potential for expanded underground or open pit mining as part of the background for whether its "anticipated" mine plans exist and in what level of detail they can be presented.

COMMENT: 2 -- Section 1.1.i) Molycorp identifies the mining practices it used to create the open pit and other mine features as "in common with mining practice at the time of mining" with no reference to any information on mine waste or land reclamation practices identified or used by Molycorp. Such a shallow and unsupported assertion may leave the impression that such guides to mining practice may not have existed at the time of mining.

An appropriate guide to mining practice during Molycorp open pit operations is the Society of Mining Engineer's Mining Engineering Handbook, 1973. Its section 19.5 on "Land Reclamation Following Mining", attached to this memo, identifies then existing practices which are still contested by Molycorp such as:

- 1) "terracing [by] grading of the land in such a way that short steep 'steps' or grades are separated by longer less steep slopes" (p. 19-13);
- 2) "toxic material should be buried in pits with a minimum of 3 feet of cover" (19-14);
- 3) "excessively steep slopes will lead to erosion, which is fatal to planted vegetation. the best remedies are to grade to slopes of less than 30% in high rainfall regions and stay away from long continuous slopes" (19-14) ; and
- 4) "it is important to establish a quick stabilizing cover as soon after grading as possible" (19-16); among many other recommended reclamation and conservation practices.

Molycorp has not identified any guidance on mining practices during the period of open pit and waste rock pile operation much less guidance it may have used. The Molycorp operation does not show the recognition of these or other mining practices recommended or in place at the time of

operation of the open pit and waste rock areas. A range of the most severe and expensive closeout needs at the Molycorp site may have been preventable had the SME "Land Reclamation" recommendations of the early 1970s been used by Molycorp in the early 1970s.

RECOMMENDATION: Molycorp and the New Mexico regulatory agencies should recognize that at the time the open pit and waste rock piles was being developed, land reclamation was developed practice in the mining industry, and incorporate that recognition into its considerations of condition of Molycorp's mine property and its potential to impact neighboring property or resources, following open pit and waste rock pile construction. . While the specific costs and practices identified have evolved extensively in the past three decades, many of the working principles found in contemporary reclamation guides and rules through the USA, including NM, are found in the 1973 SME Handbook.

After a review of this literature, it should be abundantly clear to all participants in the NMMA and MAA process that extensive land reclamation to address erosion control, revegetation of prevention of acid generation in mine wastes have been well recognized and recommended mining practice since at the least the early 1970s, when Molycorp was operating its open pit.

COMMENT: 3 -- Section 1.1.ii) Molycorp has provided no documentation to support the representation of "crack lines" identified in the January 31, 1996 MMD Closeout Plan. The lack of a technical analysis to support such a picture has been long overdue. Such data is essential to the identification of the extent and nature of the anticipated cave area and its impact on the waste rock piles and open area it is shown to underlie in the 1996 Figure identified by Molycorp.

RECOMMENDATION: As identified above, Molycorp should promptly provide NM agencies and the MAA participants with documentation upon which the subsidence scenarios are based. As Molycorp currently represents its "anticipated plans" as fully mining underground and open pit reserves, any and all closeout plans should consider the full extent of operations in its identification of closeout measures and financial assurance associated with third party implementation of those measures.

COMMENT: 4 -- Section 1.2) Molycorp provides no basis for its "anticipated" conclusion that the pit slopes and subsidence areas "may not achieve a post-mining land use or self-sustaining ecosystem", even before any alternative reclamation measures are identified or considered in any detail. Such a prejudged, and often stated, conclusion is likely to prevent a serious or thorough evaluation of alternative reclamation measures in the work plan, though such an evaluation is fundamental to implementation of the NMMA. In addition, Molycorp provided no indication of how the work related to planning the identification of alternatives will be conducted, much less how it would be conducted by the MAA or any independent reclamation expert if such an individual is contracted to address the question.

Section 1.3) Molycorp's work plan mentions "existing information" without identifying what it is or how the process of deciding how to "augment" it is accomplished. The work plan

provided no information on how the MAA participants or other interested parties will be involved in the identification and evaluation of "all viable options or alternatives." This is a particularly problematic and an inappropriate weakness in the work plan potential to produce a useful document for either the NMMA or NMMA because:

1) Molycorp has identified its prejudged the results of the evaluation of closeout measures alternatives; and

2) the work plan is presented to a MAA group which is purported to involve cooperative investigation and dialogue.

Section 2.1) The text of this "Scope of Work" does not provide any indication of the depth or level of detail to be developed for the design of measures which would be alternatives to the waiver or the substantive analysis which may be conducted of those designs. The "investigation and evaluation" portion of the Scope of Work fails to identify how the MAA group will be involved in the identification and evaluation of the alternative measures anticipated for presentation at the October 2000 meeting.

RECOMMENDATION : Molycorp should identify and support a mechanism for developing a range of specific alternative closeout methods and designs in collaboration with MAA participants as part of a work plan separate from the "Waiver" work plan. Such a mechanism should be defined by a specific scope of work to define the methods to be used in attainment of the very subjective and undefined measures stated in the work plan as an "evaluation ... based on implementability and likelihood of success." Molycorp should present a proposed scope of work which identifies, in detail, which parameters are anticipated for consideration in its "thorough evaluation" and how those parameters will identified and compared.

The work plan as proposed presents the development of a thorough evaluation of closeout measures within the very limited context of a waiver of applicable requirements. This bias - alternative measures vs. a waiver, rather than an open ended "what measures are best?" - is a barrier to effective evaluation of an optimum range of alternatives.

RECOMMENDATION: Molycorp should prepare a specific work plan outlining the sequence of activities necessary for a through evaluation of closeout measure separate from the "Waiver" work plan context, as the waiver proposal is not a reasonable point of common understanding among MAA participants. This "Closeout Measures Options Analysis" work plan should include late spring and summer milestones providing for an effective dialogue at the anticipated October 2000 TRC meeting.

It is appropriate for Molycorp to include in its closeout measures designs and concepts which have been identified by NMED and MMD staff, Amigos Bravos, and other interested parties during the many years of correspondence, hearings, and written comment on the Molycorp permit applications. Unfortunately, Molycorp has failed to identify these alternatives and appears to have dismissed them from consideration without the thorough or detailed analysis implied in this work plan as submitted.

II. Surface Erosion and Stability Analysis - Tailings Facility Work Plan

COMMENT: 1 -- Section 1.2) This work plan provides conclusions related to the status of vegetation which are not supported by any identifiable documentation and are not reflective of applicable criteria. The assertion that vegetation has been "in place for over twenty years" and a "good representation of post-closure conditions" are a not adequate representation of the rationale for this work plan in terms of applicable standards as found in the rationale section of the "Waiver Work Plan".

RECOMMENDATION: Unsupported conclusions should be eliminated from the work plans. The work plan should identify the performance standards or measures for the surfaces to be managed and identify means to attain those standards in the scope of work. Any conclusions about the effectiveness or adequacy of closeout method must be supported by underlying data or literature.

COMMENT 2: -- Section 2) Molycorp's conclusion about minimal erosion of the tailings surface is unsupported and not set in a context of appropriate criteria for such a determination to be made. The reliance of Molycorp on prejudged conclusions without reference to supporting data is not appropriate for an investigative effort such as the work plans. Concerns related to the test plots in the tailings and other areas of the mine are to be addressed by Jim Kuipers.

RECOMMENDATION: The work plans should identify parameters for data and analysis, not present unsupported conclusions if a serious discussion is seriously anticipated.

COMMENT: 3 -- General) The work plan fails to identify the geologic faulting mapped by Molycorp through Robertson Geoconsulting and South Pass Resources which occurs under the tailings or address the implications of these faults for the long term stability of the tailings area. Similarly the work plan does not identify or indicate that the work plan will address the full extent of tailings loading at the site, based on "anticipated mining" as represented by Molycorp in the "Waiver" work plan. These conditions should be fundamental elements in the analysis of the erosion and stability aspects of the tailings site.

RECOMMENDATION: The work plan should identify the nature and extent of the fault systems identified under the tailings dams and consider their potential impact on stability, as well long-term ground water seepage management, of the tailings areas. All tailings area closeout plan analyses should include consideration of fully loading tailings dams with more than twice the existing storage capacity in place.

III. Surface Erosion and Slope Stability - Mine Site Work Plan

COMMENT: 1 -- General) The lack of a substantive discussion of anticipated mine plans and their geotechnical impacts prevents a effective review or analysis of Molycorp assumptions

upon which the work plan is based.

RECOMMENDATION: A detailed description of the extent of "anticipated mining" as permitted, based on Molycorp's design limits, must be provided to define the type and extent of impacts associated with the proposed underground and surface mining activities. Such detailed description is necessary for evaluation of any of the closeout plans and associated financial instruments as they define the full extent of operations permitted at this time.

COMMENT: 2 -- Section 1.1.i) Molycorp mentions that "proposed underground future mining will result in some cave zone formation under the mine rock piles in Goathill Gulch" and that "no significant mass movement (instability) has been experienced in the piles...." . Visual observation of the cave zone, however indicates the cave zone spreading would result in such a significant collapse as to require the analysis of a major instability in the waste rock overlying a proposed the cave zone before the caving is permitted to proceed.

RECOMMENDATION: Molycorp must analyze the full extent of cave zone impact beneath existing and proposed waste rock piles and pit areas and their implications for NMMA standards as a core area of the erosion and stability work plan. Due to the waste rock pile instability which expanding cave zone will generate, limitations on future mining to prevent caving until a closeout plan is in place should be considered.

COMMENT 3 -- Section 2.1.i.a) Molycorp will use "previous data" to "determine potential areas of concern" on mine site stability and erosion matters.

RECOMMENDATION: Molycorp should identify and distribute this "previous data" and include data from NMED and ONRT research and other sources, as well as identify concerns from those documents, interviews with interested parties and other sources. The work plan should determine if the identified data from cited SRK sources is adequately comprehensive as a source of all potential areas of concern. Molycorp and Robertson Geoconsulting should contact MAA participants directly to identify areas of concern and not rely solely on Molycorp contractor sources (as no other sources are mentioned in the work plan).

COMMENT 4 -- Section 2.3) Molycorp asserts that "current experience with the cave zone surface deformations is that a great proportion of the vegetation on the pre-slump surfaces survive the subsidence and continue to flourish." This impression is directly counter to visual appearance of the existing cave zone where the slopes are collapsing, physically falling out from under existing trees and other vegetation, and trees can be seen tilting over at extreme angles as the surface deforms beneath them.

RECOMMENDATION: Molycorp should eliminate reference to present cave zone surface vegetation as "flourishing" over the cave zone and more accurately describe the severity of surface deformation and its effect associated with the cave zone it is creating. Examples from other mines with cave zone would be valuable in this area.

IV. Background Characterization Work Plan

While a significant set of comments were identified on this work plan, only selected comments are listed at this time.

COMMENT 1 -- Section 1) The work plan provides no background or rationale related to the regulatory or statutory need for such a study. The background study is not related to the identification of impacts from the mine complex, indeed it focuses resources that could be spent on the mine site and areas effected by mine activities on lands not under permit or proposed for permitting under NMMA.

As such, a convincing rationale for the work plan in the context of NMMA extension and closeout plan activities is not identifiable. As the mine is operating without an approved closeout plan, it is not appropriate to be allocating time for tasks related to this work plan unless a clear link to the NMMA requirements is identified.

RECOMMENDATION: The Background study work plan should only be implemented after all other work plans are identified as complete and a specific rationale related to applicable standards is provided.

COMMENT: 2 -- Section 1.2) While Molycorp identifies two studies by NMED and ONRT related to impacts of the mine on Red River water quality and sediment loads, it has failed address their content in a substantive manner or incorporate their content into the conceptual model, which appears to be unchanged from the narrative of it provided by Molycorp in January 2000.

As the ONRT study appears to demonstrate significantly increased metals loads in Red River-fed lake sediments downgradient from the mine site during mine operations when compared to sediments at the same site prior to mining, Molycorp's concern for an extensive effort to characterize non-mine watershed appears to be misplaced.

RECOMMENDATION: Molycorp should fully address the implications of the ONRT study, including convening TRC meetings with the study authors to fully evaluate the implications of the study before additional resources are allocated to the "Background Characterization Work Plan."

COMMENT: 3 -- General) The background study ignores:

- 1) the effect on the Red River of the dozens and dozens of marginally remediated tailings spill into the Red River during the decades of mining in the watershed; and
- 2) the impacts of seepage from mine waste and mine workings which may enter the Red River as a result of operation.

Molycorp's work plan also fails to recognize the significance of the well-documented reproducing trout populations found in the Red River during the period immediately prior to

mine start up as a demonstration of the high quality of pre-mining water in the Red River. A period when the watershed with only scars and no waste rock or open pit sources would contribute to water quality.

RECOMMENDATION: Molycorp should recognize and quantify the full range of identifiable impacts on the Red River associated with mine activities prior to efforts to quantify offsite sources of Red River water quality change, especially in the light of the ONRT study cited in the work plan. Molycorp should recognize the implications of a reproducing trout population as a representation of water quality prior to mining and address impacts to the stream, stream bed and alluvial material from tailings spill and mine seepage impacts, before further work on the background characterization work plan as submitted proceeds.